

ON THE GENUS REMONDIA, GABB. A GROUP OF
CRETACEOUS BIVALVE MOLLUSKS.

By TIMOTHY W. STANTON,
Custodian of Mesozoic Invertebrates.

IN 1869 W. M. Gabb¹ described a small collection of Cretaceous fossils obtained by Auguste Rémond de Corbineau near Arivechi, in the State of Sonora, Mexico. The horizon is now known to be about the same as that of the Comanche Peak limestone, which is near the middle of the Texan Comanche series. Among these fossils were several specimens of a peculiar shell for which Gabb proposed the generic name *Remondia*, with the following description:

"Shell compressed, elongate subquadrate, closed at the extremities (or perhaps slightly gaping posteriorly). Ligament very short, external. Hinge composed of three radiating cardinal teeth in each valve, and a long posterior tooth in the left with a corresponding tooth in the right. The middle cardinal tooth of the left valve is transversely striated as in *Trigonia*, and is slightly grooved on its face: the anterior is linear and smooth, and the posterior is also smooth, at least on its posterior face. The posterior lateral and its corresponding cavity are irregularly rugose. In the right valve the anterior tooth is as large as the middle; the posterior is linear; further details unknown.

"This genus is evidently closely allied to *Trigonia*, its quadrate form not being unlike many of the species of that genus, and the transversely striate teeth showing a marked resemblance."

Type.—*Remondia furcata*, Gabb.

The genus has been recognized in the manuals of conchology and paleontology and placed in the Trigoniidae by Tryon, Zittel, and Fischer, though the latter remarks that it would perhaps be better placed near *Astarte*. Stoliczka referred to it *Astarte bronni*, Krauss, from the Lower Cretaceous of South Africa, and recently Cragin² has described a species, *Remondia ferrissi*, from the Lower Cretaceous of southern Kansas.

¹Paleontology of California, II, pp. 257-276.

²Amer. Geol., XIV, July, 1894, p. 5, pl. I, fig. 1; Bull. Washburn College Lab. Nat. Hist., II, No. 10, p. 68.

In 1887 Dr. C. A. White¹ described the genus *Stearnsia* and referred it to the Crassatellidæ, the type being *Stearnsia robbinsi*, from the Comanche series near Fort Worth, Texas. As it differed greatly from *Remondia furcata* in outline and showed no relationship with *Trigonia* no comparisons with Gabb's genus were suggested.

When examining the types of *Remondia* in the Academy of Natural Sciences, Philadelphia, a short time ago, my attention was attracted to their striking resemblance to *Stearnsia* in surface sculpture, form of lunule and esutcheon, and other external characters. Through the courtesy of the Curators of the Academy I have been permitted to study these types more closely and to make direct comparisons with the types of *Stearnsia* in the United States National Museum.

The study of the specimens has shown some errors in the original description of *Remondia*, especially in the details of the hinge, that have prevented the genus from being understood.

The cardinal teeth were clearly seen by Gabb in only one fragmentary specimen, which he described and figured as a left valve, but which is really a right valve, as the lines of growth and position of the ligament show. It has three cardinal teeth as described, but the hinge of the left valve when cleaned shows only two cardinals, thus agreeing with *Stearnsia*. The striation of the cardinal teeth, which seems to have been the principal reason for referring the genus to the Trigoniidæ, is precisely like that seen in many species of *Crassatella* and *Astarte*—*Crassatella radosa*, Morton, for example. There is a long slightly rugose posterior lateral lamina or tooth in the left valve and a similar anterior one in the right valve, with corresponding sockets opposite them. This also agrees essentially with *Stearnsia*, though in the original description of that genus the structure here designated as a socket is regarded as two lateral teeth. The character of the lateral laminae is precisely like that seen in some species of *Crassatella*, such as *Crassatella undulata*, Say, from the Miocene, excepting that their positions are reversed, the right valve of the *Crassatella* bearing the posterior lamina and the left valve the anterior one.

The ligament, instead of being external as described, was partly internal, and a linear lamina traversing the area of attachment indicates that it was separated into ligament proper and resilium.

With these emendations of Gabb's description it is evident that *Remondia* has all the essential features of the Crassatellidæ, or Crassatellitidæ, as the family is now called.² The cardinal formula is the same ($\frac{L_{1010}}{R_{1010}}$), and it differs from *Crassatella* (*Crassatellites*) only in the more equal development of the cardinal teeth, the partially external position of the ligament, and the arrangement of the lateral laminae.

Stearnsia is regarded as a synonym of *Remondia*. The two species on

¹Proc. Acad. Nat. Sci. Phila., 1887, p. 32.

²W. H. Dall, Tertiary Mollusks of Florida, Pt. II, Trans. Wagner Free Inst. of Sci., III, p. 539.

which the genera were based agree in hinge structure, in character of sculpture, especially in early stages of growth, in form of the lunule and escutcheon, and in the presence of an umbonal ridge with an accompanying furrow which produces an emargination of the posterior end. Their chief differences are the external form—subtriangular in the one and elongate subquadrate in the other—and the fact that in *Stearnsia robbinsi* the free margins of the valves are smooth, while in *Remondia furcata* they are crenulate within, but in both these respects there is an equal amount of variation in the genus *Crassatella*.

The genus may be redefined as follows:

Family CRASSATELLITIDÆ.

Genus REMONDIA, Gabb.

(Plate XXVI, figs. 1-8.)

Shell rather compressed, equivalve or nearly so, elongate subquadrate to subtriangular in outline; lunule and escutcheon well marked and deeply excavated; ligament partly internal; hinge with three cardinal teeth and an anterior lateral lamina in the right valve and two cardinals with a posterior lateral lamina in the left; free margins smooth or crenulate within; sculpture consisting of strong concentric ridges and furrows which may become obsolete in later stages of growth; posterior end usually (always?) emarginate.

Type.—*Remondia furcata*, Gabb. Other examples: *Remondia ferrissi*, Cragin, *Stearnsia robbinsi*, White, and possibly *Astarte bronni*, Krauss,¹ *Astarte sinuata*, d'Orbigny, and *A. carinata*, d'Orbigny.

Note.—The specimens of *Remondia robbinsi* figured are No. 20137, United States National Museum Catalogue of Invertebrate Fossils. Those of *R. furcata* are in the collection of the Academy of Natural Sciences of Philadelphia.

EXPLANATION OF PLATE.

PLATE XXVI.

Remondia furcata, Gabb.

	Page.
FIG. 1. Fragment showing the umbonal portion of a right valve.....	
2. Hinge of same. (This is the hinge figured by Gabb in Paleontology of California, II, pl. 36, fig. 17a)	
3, 4. Two views of Gabb's other figured type	
5. Hinge of left valve from a specimen in the type lot.....	299
<i>Remondia robbinsi</i> (White).	
6, 7. Two views of one of the types (from the original drawings published by White).....	
8. Hinge of left valve of another specimen (from the original drawing of a type).....	300

¹I have not had access to the description and figures of this species.